Integrating fast heuristics into a decision support system for vehicle rescheduling

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Transportation companies create their schedules in advance for a longer planning period. However, several unforeseen events can occur that render these pre-planned schedules infeasible. Companies have to deal with the disruptions almost immediately, and propose a new schedule that executes every disrupted event in a feasible manner once again. This process is called the vehicle rescheduling problem (VRP). Exact solution of this problem is not an option, because creating an optimal vehicle schedule with multiple different vehicle types is NP hard [1]. Because of these facts, fast heuristics have to be introduced.

Operators of a transportation company use their past experience in the case of such disruptions. Solutions given by fast methods for the VRP can be used as suggestions for the operators to help their planning process. In this talk, we introduce a decision support system for the VRP that provides multiple solutions with good quality in "quasi-real time". The system works independently of the solution methods, and because of this, new heuristics can be easly integrated into the framework. The best solutions of the methods are selected and given to the operator as suggestions. We also present some of our proposed heuristics from [2], and show their integration in such a system.

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References

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